**SECTION A ~ Multiple-choice questions**

**QUESTION 1.**

Whilst considering the dimensions of physical activity during an observation period, a researcher knows that context refers to:

**D All of the above**

**QUESTION 2.**

A benefit associated with having a physically active group of office workers who participate in lunchtime activities such as running, power walking and gym workouts includes:

**D All of the above**

**QUESTION 3.**

The most likely cause of fatigue for a 100m sprinter such as Asafa Powell (athletics) is:

**A PC depletion**

**QUESTION 4.**

Jana Pittman’s training year can be broken down into smaller sections such as “pre-season”, “competition” and “off-season”. These are examples of:

**A Periodisation**

**QUESTION 5.**

In the following exercise prescription for resistance training used by Stuart Rendell (Men’s Hammer Throw) ~ 4 x 8 x 180kg, the 4 represents:

**B Sets**

**QUESTION 6.**

An individual aged 19 participating in 5 sessions per week consisting of 100 minutes of moderate physical activity and 25 minutes of vigorous-intensity physical activity would:

**D Be sufficiently active for health benefits and meet the National Physical Activity Guidelines**

**QUESTION 7.**

Reminder systems (messages on hold, computer generated messages, post-its on walls & diary entries) are essential strategies used with people in “Stages of Change” :

**C Any stage up to the action stage**

**QUESTION 8.**

The oxygen deficit experienced by Craig Mottram during the 1500 m occurs when:

**B ATP is broken down anaerobically**

**QUESTION 9.**

When considering the energy systems used by Sharelle McMahon during a netball final:

**A The aerobic system is the slowest to contribute to ATP resynthesis, but 40-50 times more powerful than the two combined anaerobic systems**

**QUESTION 10.**

Inorganic phosphates that result when PC is broken down to supply energy for Philippe Rizzo in the Men’s High Bar (gymnastics) event cause fatigue by:

**A Reducing maximum cross-bridge forming forces**

**QUESTION 11.**

Aerobic training undertaken by Kerryn McCann whilst preparing for the marathon results in:

**D All of the above**

**QUESTION 12.**

Risk management undertaken by Robert Newberry as he trains for and participates in the 10 m platform diving event includes:

**C Identifying hazards and controlling associated risk**

**QUESTION 13.**

Caffeine enhances performance endurance athletes by:

**C Promoting glycogen sparing via increased release of free fatty acids**

**QUESTION 14.**

The following example best highlights the training principle of “specificity” as used by elite athletes:

**A A road cyclist experiencing gains as a result of aerobic training completed on a stationary bicycle**

**QUESTION 15.**

Ethical considerations related to performance enhancement for players in the basketball team are:

**A A set of moral values**

**SECTION B ~ Short-answer questions**

**QUESTION 1.**

**a.**

1. Only a small proportion of the population were meeting the guidelines.
2. Research showed significant health gains could be achieved from regular moderate-intensity activity.

**b.** Household/garden, active transport and Occupational.

**c.** Any two of the following:

* Can capture quantitative and qualitative information
* Can be administered quickly and easily to large groups
* Cost-effective for large-scale studies
* Usually low-participant burden
* Has potential to predict energy expenditure from daily physical activities when compared to the compendium of physical activities.

**d.** Vigorous frequency = 3-4 days per week, duration each session = 30 mins or more

**QUESTION 2.**

**a. i.** 75% anaerobic – 25% aerobic

**ii.** 50% anaerobic - 50% aerobic

**iii.** 5% anaerobic. - 95% aerobic

**b.** Athlete has been exercising continuously for 4 1/2 minutes & has therefore had sufficient time to adjust to the workload & meet demands aerobically. Athlete wouldn’t be able to continue for this long if meeting the demands anaerobically.

**c.** Glycogen

**d.** Any 3 of: warm down by remaining active – same activity but much lower intensity; massage to assist venous return; wear body stocking to assist circulation; light stretching; mental imagery; meditation; autogenic training; hydrotherapy; progressive muscle relaxation; breathing techniques

**e.** Any 3 of: **Increased** - maximum stroke volume; plasma volume; haemoglobin; ventricular size (cardiac hypertrophy); total blood volume; venous return; myocardial contractility; cardiac output; blood flow to working muscles; capillarisation; A-VO2 difference (oxygen extraction)

**Decreased** – systolic & diastolic blood pressure; resting & sub-maximal heart rate

**QUESTION 3.**

**a.** Provides information re. distance/duration and intensity of work & rest bouts when combined with information re. frequency will give a clear indication of how long & how hard the work bouts should be & the duration & type of rest required.

**b.** Accumulation of metabolites as a consequence of the many sprints; depletion of glycogen stores due to distance covered; dehydration/elevated body temperature

**c.** Enable higher oxygen consumption to get athlete back to pre-exercise condition including- resynthesis of ATP & PC; oxidisation of lactate to glycogen; restoration of oxygen to myoglobin & blood; thermogenic effects of elevated core temperature; increased use of fat to resynthesise glycogen

**d.** Any of: Increase the strength of hamstrings; ensure balanced strength of hamstrings and quadriceps; avoid over stretching; control environmental conditions of training – heat/cold; Surgery to remove scarring of tissue; not training whilst injured

**QUESTION 4.**

**a.** **Muscular power** = athlete is performing an explosive action involving leaping up to intercept the ball. Could argue a case for **agility** = changing body position quickly and accurately

**b. i.** Vertical jump test

**ii.** good score male > 55 cm ; female > 45 cm

**c.** Plyometrics – leaping & bounding movements are consistent with the actions employed by the goal keeper when springing off one or two feet

**d.** Any 3 of: Increased FT fibre size; Increased energy substrate levels in muscle (ATP, CP, Creatine, glycogen); increased ATP-PC splitting & resynthesis of enzymes; increased ventricle thickness; increased contractile proteins in muscle; muscle hyperplasia; increased tolerance of muscle and blood lactate; increased myosin ATPase

**e.** Any of: Sound application of training principles; correct use of training equipment; sound training design; ensuring adequate recovery between training sessions; avoiding environmental stress factors; ensure adequate fluid intake

**QUESTION 5.**

**a.** 10,000

**b.** Any two of:

* Inexpensive
* Small, lightweight and non-invasive
* Easy to administer to large groups
* Useful to administer to large groups
* Useful for detecting change in daily average steps taken between pre- and post-tests, or to identify changes in rank order among groups
* Objective measurement of the most common physical activity behaviour (walking)
* Appropriate for use in a range of settings (workplace, community & schools)
* Provide immediate feedback and have the potential to promote behaviour change.

**c.** The pedometer provides no information about intensity of physical activity, whereas a heart rate will display the increase in heart rate associated increased intensity of walking uphill.

**d.** The pedometer is unable to record the magnitude of the movement detected of the movement regardless of intensity or mode. An accelerometer will display and increase in movement counts which represents increasing intensity and acceleration associated with jumping in a vertical plane.

**QUESTION 6.**

**a.** Any of: Unemployed persons; people with a lower level of educational attainment; older people; overweight or obese people

**b.** Participation in a club, organization or association that provides organised sport. Involvement in a team or group can provide the support necessary to maintain interest and involvement

**c.** Any of: Effective Walking Bus initiative; increased social interaction among residents of a neighbourhood; positive relationships; fewer cars being driven near schools; safer streets; increased physical activity and increased community connectedness

**d.** Interventions are most effective when a comprehensive multi-strategy approach is adopted. Providing a supportive physical and social environment through the settings where people live and work- community, school and workplace.

**QUESTION 7.**

**a.** Any of: persistent soreness; heaviness and weakness in the muscles; body aches; increased incidence of injuries; prolonged fatigue; loss of appetite and weight loss; intolerance to training; delayed recovery from training; elevated resting heart rate; dehydration; excessive sweating; insatiable thirst; increased susceptibility to infections; hyperactivity; slower heart-rate recovery; gastrointestinal disturbances; nausea; swelling of the lymph nodes; menstrual irregularities (women)

**b.** Moodiness; easily irritated and angry; increased anxiety and depressive; loss of competitive drive; loss of motivation & enthusiasm; reduced concentration; apathy; tiredness; loss of energy; inability to relax; twitchy & fidgety; altered sleep patterns; confusion; excessive emotions; feelings of helplessness; decreased concentration; boredom & reduced confidence.

**c.** Unprofessional behaviour by coach; implement programs beyond their knowledge & qualifications; not keeping qualifications current; unqualified administering of first-aid

**d.** Any of: Record of injuries and illness; physical preparation; correct use of protective equipment; safe playing environment; adequate hydration; asthma management

**e.** Ensuring equipment is correctly maintained; ensuring equipment is correctly used;

ensure equipment is used for the purpose for which it is intended; wear appropriate safety equipment

**QUESTION 8.**

**a.** Anabolic steroids

**b.** Increases capacity for athlete to train harder and longer with less muscle damage; increased muscle size(hypertrophy) and associated stores of ATP and PC

**c.** Any of: It is unfair to gain an advantage illegally – should be a “level playing field”; who deserves credit for the victory/success; what constitutes personal best; long term (irreversible) medical problems; what message is being sent to other athletes?

**d.** Any of sprint training (or other suitable high intensity training methods); appropriate diet; mental rehearsal; mental imagery/visualisation; meditation;

**e.** No.

**f.** Altitude training is beneficial for endurance athletes as it increases the oxygen carrying capacity of the blood. Since the athlete performs anaerobically the oxygen carrying capacity is not relevant.

**QUESTION 9.**

**a.** Action

**b.** Pre-contemplation

**c.** Any two of the following:

* Increasing knowledge- encourage the individual to read and think about physical activity
* Being aware of the risk- provide the individual with the message that being inactive is very unhealthy
* Caring about the consequences-encourage the person to recognise how their inactivity affects their family, friends and co-workers
* Comprehending benefits- assist the individual to understand the personal benefits of being physically active
* Increasing health opportunities-help the individual increase their awareness of opportunities to be physically active.

**d.** An individual who has been regularly active for over five years would be considered in the termination stage.

**QUESTION 10.**

**a.** Any one of the following:

* + Conduct an environmental audit to identify physical activity opportunities and how many people are using the physical activity facilities and areas.
  + Conduct a campaign to encourage employees to use the stairs rather than the lift.
  + Encourage employers to provide gym memberships at subsidised rates.
  + Incentives to cycle or walk to walk rather than drive cars.
  + Provision of facilities such as showers and change rooms to support physical activity before, during and after work hours.

**b.** Sample answers: Elevators can only be used to travel up and stairs must be used to go downstairs. OR designate Wednesdays as the day each week employees are meant to wear activity clothing to work.

**QUESTION 11.**

**a.** Oxygen Debt (or EPOC)

**b.** Yes. The oxygen consumption levels off indicating oxygen supply equals oxygen demand

**c.** Enable higher oxygen consumption to get athlete back to pre-exercise condition including- resynthesis of ATP & PC; resynthesis of lactate to glycogen; oxidisation of lactate & other metabolites; restoration of oxygen to myoglobin & blood; thermogenic effects of elevated core temperature; increased use of fat to resynthesise glycogen

**d.** **A** - Aerobic energy system;

**B** – Mixture of anaerobic and aerobic energy systems;

**C** - Aerobic energy system able to meet demands (athlete achieves steady state)

**QUESTION 12.**

**a.** Focusing on the next segment of play; using positive self-talk; using positive images; being adequately trained; following a game plan; knowing what to expect by rehearsing physical and mental scenarios

**b.** Any of: Over-training; playing too many competitions; inadequate rest/recovery; too rapid increase in training load; monotony and lack of variation

**c.** Is the athlete Pain free; has a full range of motion; full or close to full strength; no swelling

**d i.** Repetitions

**ii.** Specificity of training – represents the distance Serena will often run

**iii.** Increase number of reps; increase number of sets; increase the distance; decrease rest interval (not usually recommended)

**iv** Increased FT fibre size; Increased energy substrate levels in muscle – ATP, PC, creatine, glycogen; increased ATP-PC splitting & resynthesis of enzymes; increased ventricle thickness; increased contractile proteins in muscles

**QUESTION 13.**

**a.** Any of: harm prevention; honesty; avoiding conflict of interest; duty of care; basic justice and fairness; taking unfair advantage; level playing field; health risks

**b.** Answers such as: Distance training; altitude training; nutritional supplementation; carbohydrate loading; visualisation

**c. i.** A

**ii.** Blood lactate levels drop as the lactate is oxidised and converted into glycogen

**iii.** Increased body temperature can lead to competing demands for blood supply as the body uses the redistribution of blood to the body surface to regulate core temperature resulting in decreased blood flow to working muscles.

Decreased blood flow to working muscles can also lead to increased accumulation of lactic acid and metabolites leading to fatigue

**QUESTION 14.**

**a.** Circuit training

**b.** By increasing the repetitions

**c.** In some cases yes in others no. By increasing the reps for each exercise by around 10% per week the athlete is allowing for a gradual but steady increase in workload. This occurs with the skipping. The press ups increase gradually initially then jump dramatically in week 5 – almost doubling. This would be inappropriate. Similarly the squat jumps, sit ups and shuttle runs show gradual increases then a large increase in week 5.

**d.** Increase the sets; increase the number of exercises in the program; reduce the time taken to complete the program; apply weights during some exercises; reduce recovery between exercises

**e.** Any of: Local muscular endurance; C/R endurance; agility

**f i.** Time taken to complete circuit; feelings before & after circuit; weather conditions; type of warm up & warm down used

**ii.** Can track workloads to ensure overload and other principles are applied correctly;

can track goals; records of injuries can ensure the athlete doesn’t resume too quickly

**QUESTION 15.**

**a.** Any two of the following:

* Can be performed anywhere
* Can be performed anytime
* Can be performed alone of with one or two others
* Requires minimal equipment

**b.** Yes because Jason accumulates five sessions per week

**c.** Yes because Jason accumulates a total of 150 minutes of physical activity per week (**note vigorous minutes are multiplied by two**).